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DOCUMENT-IDENTIFIER: US 4501835 A

TITLE: Polyacrylic acid/chitosan polyelectrolyte complex

Brief Summary Text (6):

Chitin and chitosan films and membranes are known to the art, both as the sole component and in combination with another material; for example, membranes of chitosan and polyvinyl alcohol, chitosan and cellulose acetate and sulfoethyl chitosan. Chitin membranes are generally prepared by acetylating chitosan membranes. See for example, R. A. A. Muzzarelli, Chitin, Pergamon Press, 1977.

Brief Summary Text (18):

A self-supporting film may be formed from the solution of the complex by applying a coating on a suitable base or support. Any suitable coating means known to the art may be employed, including, but not limited to, slot-head coating, wire-wound rod and curtain coating. The particular base or support is not critical, although whether or not the film is to be stripped from the support should be considered in the selection of the support. The coating of the complex is dried, preferably at elevated temperatures to provide an optically clear, colorless film which, if desired, can be stripped from the support. Substantially any thickness film can be prepared. If the support is intended to act as a support for the membrane, a porous or permeable material may be employed and, in such a case, the film would not be stripped therefrom.

Brief Summary Text (19):

Anisotropic membranes can be prepared by phase inversion techniques known to the art employing the complex of the present invention. An anisotropic membrane can be prepared by coating, for example, a solution of the complex on a support. The fluid coating is allowed to air dry until a thin skin forms on the surface, immediately after which, the film is immersed in dilute alkali, e.g., 0.1N sodium hydroxide or 0.5N sodium acetate to coagulate the complex and then washed with water to remove the alkali. Care should be taken that the concentration of the alkali and/or time of contact not be sufficient to extract the polyacrylic acid.

Brief Summary Text (20):

If desired, as a coating aid, a non-ionic surfactant may be employed. The specific surfactant is not critical and conventional surfactants known to the art may be employed. The level of surfactant may range from about 0.1% by weight to about 5% by weight, of solution, preferably about 0.1% by weight depending upon the wettability of the surface of the particular support employed.

Detailed Description Text (13):

To the solution prepared in Example 1 was added 0.05% (weight basis) of a non-ionic surfactant (Neutronyx N-600, an alkylphenol polyglycol ether containing 9.5 moles ethylene oxide sold by Onyx Chemical Co., Jersey City, N.J.), and 1% glycerine as a plasticizer. An adjustable doctor blade was employed to draw down a layer 500 um thick on a polyester film base. The coating was dried at 60.degree. C. to an optically clear, colorless film 25 um in thickness. The film was stripped from the support and was self-supporting.

CLAIMS:

5. A product of claim 4 wherein said film is carried on a support.
15. The product of claim 11 wherein said membrane is carried on a support.
16. The product of claim 15 wherein said support is a permeable support.
21. A method for preparing a membrane which comprises forming a polyelectrolyte complex by dissolving chitosan in an acid, adding a solution of polyacrylic acid having a molecular weight (weight average) of less than 10,000 thereto and coating a support with said complex.
22. The method of claim 21 which includes the step of removing the thus-formed membrane from said support.
23. The method of claim 21 wherein a surfactant is added to said complex prior to coating said support.
24. The method of claim 21 wherein a plasticizer is added to said complex prior to coating said support.
25. The method of claim 22 wherein said membrane is immersed in a plasticizer subsequent to removal from said support.